

# Publications by Jared Miller

## I. JOURNAL PAPERS (PUBLISHED)

- 1) J. Miller and M. Sznaier, “Bounding the Distance to Unsafe Sets with Convex Optimization,” *IEEE Transactions on Automatic Control*, vol. 68, no. 12, pp. 7575 – 7590, 2023. [\[link\]](#)
- 2) J. Zheng, T. Dai, J. Miller, and M. Sznaier, “Robust Data-Driven Safe Control using Density Functions,” *IEEE Control Systems Letters*, vol. 7, pp. 2611–2616, 2023. [\[link\]](#) (LCSS-CDC)
- 3) J. Miller and M. Sznaier, “Data-Driven Gain Scheduling Control of Linear Parameter-Varying Systems using Quadratic Matrix Inequalities,” *IEEE Control Systems Letters*, vol. 7, pp. 835–840, 2022. [\[link\]](#) (LCSS-ACC)
- 4) J. Miller, Y. Zheng, M. Sznaier, and A. Papachristodoulou, “Decomposed structured subsets for semidefinite and sum-of-squares optimization,” *Automatica*, vol. 137, pp. 110–125, 2022. [\[link\]](#)
- 5) J. Miller, D. Henrion, and M. Sznaier, “Peak Estimation Recovery and Safety Analysis,” *IEEE Control Systems Letters*, vol. 5, no. 6, pp. 1982–1987, 2021. [\[link\]](#) (LCSS-ACC)
- 6) J. Miller, M. A. Al-Radhawi, and E. D. Sontag, “Mediating Ribosomal Competition by Splitting Pools,” *IEEE Control Systems Letters*, vol. 5, no. 5, pp. 1555–1560, 2021. [\[link\]](#) (LCSS-ACC)

## II. JOURNAL PAPERS (SUBMITTED)

- 1) J. Miller, M. Tacchi, M. Sznaier, and A. Jasour, “Peak Value-at-Risk Estimation of Stochastic Processes using Occupation Measures,” 2024. [\[link\]](#)
- 2) J. Miller, M. Tacchi, D. Henrion, and M. Sznaier, “Unsafe Probabilities and Risk Contours for Stochastic Processes using Convex Optimization,” 2024. [\[link\]](#)
- 3) J. Miller and M. Sznaier, “Peak Estimation of Hybrid Systems with Convex Optimization,” 2023. [\[link\]](#)
- 4) J. Miller, T. Dai, and M. Sznaier, “Data-Driven Stabilizing and Robust Control of Discrete-Time Linear Systems with Error in Variables,” 2023. [\[link\]](#)

## III. PHD THESIS

- 1) J. Miller, *Safety Quantification for Nonlinear and Time-Delay Systems using Occupation Measures*. PhD thesis, Northeastern University, April 2023. [\[link\]](#)

## IV. CONFERENCE PROCEEDINGS (PUBLISHED)

- 1) J. Miller, T. Dai, and M. Sznaier, “Superstabilizing Control of Discrete-Time ARX Models under Error in Variables,” *IFAC-PapersOnLine*, vol. 56, no. 2, pp. 2444–2449, 2023. 22nd IFAC World Congress
- 2) J. Miller, T. Dai, and M. Sznaier, “Data-Driven Superstabilizing Control of Error-in-Variables Discrete-Time Linear Systems,” in *2022 61st IEEE Conference on Decision and Control (CDC)*, pp. 4924–4929, 2022. [\[link\]](#)
- 3) J. Miller and M. Sznaier, “Bounding the Distance of Closest Approach to Unsafe Sets with Occupation Measures,” in *2022 61st IEEE Conference on Decision and Control (CDC)*, pp. 5008–5013, 2022. [\[link\]](#)
- 4) F. Bečanović, J. Miller, V. Bonnet, K. Jovanović, and S. Mohammed, “Assessing the Quality of a Set of Basis Functions for Inverse Optimal Control via Projection onto Global Minimizers,” in *2022 IEEE 61st Conference on Decision and Control (CDC)*, pp. 7598–7605, 2022. [\[link\]](#)
- 5) J. Miller and M. Sznaier, “Facial Input Decompositions for Robust Peak Estimation under Polyhedral Uncertainty,” *IFAC-PapersOnLine*, vol. 55, no. 25, pp. 55–60, 2022. [\[link\]](#)

- 6) J. Miller, D. Henrion, M. Sznaier, and M. Korda, “Peak Estimation for Uncertain and Switched Systems,” in *2021 60th IEEE Conference on Decision and Control (CDC)*, pp. 3222–3228, 2021. [\[link\]](#)
- 7) J. Miller, R. Singh, and M. Sznaier, “MIMO System Identification by Randomized Active-Set Methods,” in *2020 59th IEEE Conference on Decision and Control (CDC)*, pp. 2246–2251, 2020. [\[link\]](#)
- 8) J. Miller, Y. Zheng, M. Sznaier, and A. Papachristodoulou, “Decomposed Structured Subsets for Semidefinite Optimization,” in *2020 21st IFAC World Congress*, 2020. [\[link\]](#)
- 9) C. Wu, J. Miller, Y. Chang, M. Sznaier, and J. Dy, “Solving Interpretable Kernel Dimensionality Reduction,” in *Advances in Neural Information Processing Systems* (H. Wallach, H. Larochelle, A. Beygelzimer, F. d’Alché-Buc, E. Fox, and R. Garnett, eds.), vol. 32, pp. 7915–7925, Curran Associates, Inc., 2019. [\[link\]](#)
- 10) J. Miller, Y. Zheng, B. Roig-Solvas, M. Sznaier, and A. Papachristodoulou, “Chordal Decomposition in Rank Minimized Semidefinite Programs with Applications to Subspace Clustering,” in *2019 IEEE 58th Conference on Decision and Control (CDC)*, pp. 4916–4921, 2019. [\[link\]](#)
- 11) J. Miller and B. Shafai, “A Model of Heave Dynamics for Bagged Air Cushioned Vehicles,” in *2019 IEEE Conference on Control Technology and Applications (CCTA)*, pp. 976–981, 2019. [\[link\]](#)
- 12) B. Taskazan, J. Miller, U. Inyang-Udoh, O. Camps, and M. Sznaier, “Domain Adaptation Based Fault Detection in Label Imbalanced Cyberphysical Systems,” in *2019 IEEE Conference on Control Technology and Applications (CCTA)*, pp. 142–147, 2019. [\[link\]](#)

## V. CONFERENCE PROCEEDINGS (ACCEPTED)

- 1) J. Miller, J. Zheng, M. Sznaier, and C. Hixenbaugh, “Data-Driven Superstabilization of Linear Systems under Quantization,” in *2024 American Control Conference (ACC)*, 2024. [\[link\]](#)
- 2) J. Miller, M. Tacchi, M. Sznaier, and A. Jasour, “Peak Value-at-Risk Estimation for Stochastic Differential Equations using Occupation Measures,” in *62nd IEEE Conference on Decision and Control*, 2023. [\[link\]](#)
- 3) J. Miller, T. Dai, M. Sznaier, and B. Shafai, “Data-Driven Control of Positive Linear Systems using Linear Programming,” in *62nd IEEE Conference on Decision and Control*, 2023. [\[link\]](#)
- 4) J. Miller, M. Korda, V. Magron, and M. Sznaier, “Peak Estimation of Time Delay Systems using Occupation Measures,” in *62nd IEEE Conference on Decision and Control*, 2023. [\[link\]](#)

## VI. CONFERENCE PROCEEDINGS (SUBMITTED)

- 1) M. Abdalmoaty, J. Miller, M. Yin, and R. S. Smith, “Frequency-Domain Identification of Discrete-Time Systems using Sum-of-Rational Optimization,” 2023. [\[link\]](#)
- 2) J. Miller and R. Smith, “Peak Estimation of Rational Systems using Convex Optimization,” 2023. [\[link\]](#)

## VII. PREPRINTS

- 1) J. Miller and M. Sznaier, “Quantifying the Safety of Trajectories using Peak-Minimizing Control,” 2023. [\[link\]](#)
- 2) J. Miller and M. Sznaier, “Analysis and Control of Input-Affine Dynamical Systems using Infinite-Dimensional Robust Counterparts,” 2023. [\[link\]](#)

## VIII. SEMINARS

- 1) “Data-Driven Safety Quantification using Robust Optimization,” October 18, 2023, Cybernetic Systems and Controls Lab (CSCL), Arizona State University, Tempe, AZ. [\[link\]](#).
- 2) “Risk analysis for stochastic processes using polynomial optimization,” October 15-18, 2023, Convex Relaxations for Polynomial Optimization, INFORMS Annual Meeting, Phoenix, AZ [\[link\]](#).
- 3) “Data-Driven Safety Quantification using Robust Optimization,” October 11, 2023, Safe Autonomy and Intelligent Distributed Systems (SAIDS) group, University of Southern California, Los Angeles, CA. [\[link\]](#)
- 4) “Data-Driven Safety Quantification using Infinite-Dimensional Robust Convex Optimization,” July 27, 2023, Konstanz Real Algebraic Geometry Seminar, University of Konstanz. [\[link\]](#)
- 5) “Data-Driven Safety Quantification using Infinite-Dimensional Robust Convex Optimization”, May 29, 2023, Student Seminar Series on Optimization, Control & Learning, UC San Diego. [\[link\]](#)
- 6) “Quantifying Safety under Uncertainty using Occupation Measures”, May 26, 2023, Control Seminars @ UCI, UC Irvine
- 7) “Data-Driven Safety Quantification using Infinite-Dimensional Robust Convex Optimization”, May 19, 2023, Multi-Robot Systems Lab Meeting, Stanford University. [\[link\]](#)
- 8) “Analysis and Control of Time-Delay Systems Using Polynomial Optimization”, May 14, 2023, MS14 Studying Dynamics using Polynomial Optimization Tools, SIAM Conference on Dynamical Systems. [\[link\]](#)
- 9) “Data-Driven Control under Input and Measurement Noise”, April 9, 2023, Oden Institute Seminar, UT Austin. [\[link\]](#)
- 10) “Safety Quantification for Nonlinear and Time-Delay Systems using Occupation Measures”, April 3, 2023, PhD Thesis Defense, Northeastern University. [\[link\]](#)
- 11) “Data-Driven Control under Input and Measurement Noise”, NYU MERIT Lab Seminar Series, New York City, Feb 21, 2023. [\[link\]](#)
- 12) “Bounding the Distance to Unsafe Sets with Convex Optimization”, DCSD Rising Stars, 2nd Modeling, Estimation and Control Conference, Jersey City, October 2-5 2022. [\[link\]](#)
- 13) Tutorials about Convexity, Interior Point Methods, Frank-Wolfe algorithms (with applications to system identification), and Polynomial Optimization, June 27, 2022, From Data to Control, Israeli Association of Automatic Control (with M. Szaier). [\[link\]](#)
- 14) “Bounding distances to unsafe sets”, June 16, 2022, IfA Coffee Talks, ETH Zurich. [\[link\]](#)
- 15) “Bounding distances to unsafe sets”, June 14, 2022, LA3 Meeting, EPFL Lausanne. [\[link\]](#)
- 16) “Bounding distances to unsafe sets”, June 3, 2022, Journées SMAI MODE, University of Limoges (XLIM). [\[link\]](#)
- 17) Tutorials about Interior Point Methods, Polynomial Optimization, Frank-Wolfe algorithms and variations, and SDP approximations, May 16-20, Sparsity and Big Data in Control, Systems Identification, and Machine Learning, European Embedded Control Institute.
- 18) “Bounding distances to unsafe sets”, April 14, 2022, Conic Linear Optimization for Computer-Assisted Proofs, Mathematisches Forschungsinstitut Oberwolfach (MFO). [\[link\]](#)
- 19) “Bounding distances to unsafe sets”, June 28, 2021, Brainstorming days on measure and polynomial optimization (BrainPOP), LAAS-CNRS. [\[link\]](#)
- 20) “Data-Driven Peak and Reachability Set Estimation”, May 25, 2021, MS112 Methods of Learning Dynamical Systems for Control, SIAM Conference on Dynamical Systems. [\[link\]](#)
- 21) “Analysis and Control of Time-Delay Systems with Occupation Measures”, May 3, 2021, BrainPOP, LAAS-CNRS. [\[link\]](#)
- 22) “Exploiting Structure in Rank-Constrained and Approximated Semidefinite Programs”, December 19, 2019, TISEM Operations Research Seminar, Tilburg University. [\[link\]](#)

## IX. SEMINARS (UPCOMING)

- 1) “Data-Driven Safety Quantification using Robust Optimization,” February 16, 2024, Institute for Systems Theory and Automatic Control (IST), University of Stuttgart, Stuttgart, DE.
- 2) “Risk Analysis of Stochastic Processes using Auxiliary Functions,” April 11, 2024, Laboratory of Signals and Systems (L2S), Paris-Saclay, FR.

## X. POSTER SESSIONS

- 1) “Risk Analysis of Stochastic Processes using Polynomial Optimization.” November 13, 2023, Future Trends in Polynomial Optimization, LAAS-CNRS, Toulouse, FR. [\[link\]](#)
- 2) “Frequency Domain Identification via Sum-of-Rational Optimization.” September 25, 2023, European Research Network System Identification (ERNSI), Stockholm, SE. [\[link\]](#)
- 3) “Safety Analysis and Control using Measures.” April 13, 2023, RISE 2023, Northeastern University. [\[link\]](#)
- 4) “Safety Analysis and Control using Measures.” February 27, 2023, PhD Research Expo, Northeastern University. [\[link\]](#)
- 5) “Diameter Constrained Minimum Spanning Graphs.” January 31, Current Themes of Discrete Optimization: Boot-camp for early-career researchers, ICERM. [\[link\]](#)
- 6) “Safety Analysis using Distance Estimation and Measures.” August 24, 2022. CLEVR-AI MURI Yearly Review Meeting, Northeastern University. [\[link\]](#)
- 7) “Exploiting SDP Structure Yields Tighter Approximations.” April 9, 2020. RISE, Northeastern University (remote). [\[link\]](#)
- 8) “Exploiting SDP Structure Yields Tighter Approximations.” February 24, 2020. IPAM Control, Learning and Optimization workshop, University of California, Los Angeles. [\[link\]](#)
- 9) “Chordal Decompositions in Rank Minimized SDPs.” May 30-31, 2019. Learning for Decision and Control (L4DC), Massachusetts Institute of Technology. [\[link\]](#)
- 10) “Chordal Decompositions in Rank Minimized SDPs.” May 10, 2019. New England Machine Learning Day, Northeastern University. [\[link\]](#)
- 11) “Scattered data interpolation through B-spline wavelets and the Elastic Net.” April 14, 2017. RISE, Northeastern University. [\[link\]](#)
- 12) “A parallelized Python-based Multi-Point Thomson Scattering analysis in NSTX-U.” October 29, 2014. 56th Annual APS Plasma Physics Conference, New Orleans. [\[link\]](#)